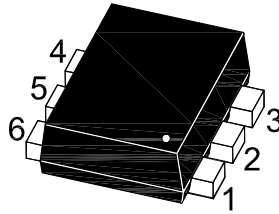
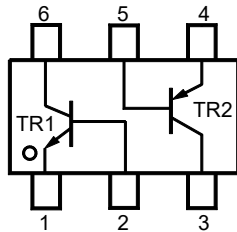


## BC8456DE~BC8458DE

### Complementary NPN / PNP Silicon Epitaxial Planar Transistors



TR1: 1. Emitter 2. Base 6. Collector  
TR2: 4. Emitter 5. Base 3. Collector  
SOT-563 Plastic package

#### Maximum Ratings ( $T_a = 25^\circ\text{C}$ ):TR1&TR2

| Parameter                 | Symbol    | Value |      | Unit |
|---------------------------|-----------|-------|------|------|
|                           |           | NPN   | PNP  |      |
| Collector Base Voltage    | $V_{CBO}$ | 80    | -80  | V    |
| BC8456DE                  |           | 50    | -50  |      |
| BC8457DE                  |           | 30    | -30  |      |
| Collector Emitter Voltage | $V_{CEO}$ | 65    | -65  | V    |
| BC8456DE                  |           | 45    | -45  |      |
| BC8457DE                  |           | 30    | -30  |      |
| Emitter Base Voltage      | $V_{EBO}$ | 6     | -6   | V    |
| BC8456DE                  |           | 6     | -6   |      |
| BC8457DE                  |           | 5     | -5   |      |
| Collector Current         | $I_C$     | 100   | -100 | mA   |
| Peak Collector Current    | $I_{CM}$  | 200   | -200 | mA   |

#### Maximum Ratings ( $T_a = 25^\circ\text{C}$ ):TR1&TR2

| Parameter                                            | Symbol          | Value         | Unit               |
|------------------------------------------------------|-----------------|---------------|--------------------|
| Total Power Dissipation                              | $P_{tot}$       | 200           | mW                 |
| Thermal Resistance Junction to Ambient <sup>1)</sup> | $R_{\theta JA}$ | 625           | $^\circ\text{C/W}$ |
| Junction Temperature                                 | $T_j$           | 150           | $^\circ\text{C}$   |
| Storage Temperature Range                            | $T_{stg}$       | - 55 to + 150 | $^\circ\text{C}$   |

<sup>1)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout

## BC8456DE~BC8458DE

### Electrical Characteristics at $T_a = 25^\circ\text{C}$ :TR1

| Parameter                                                                                                                                 | Symbol                                                                                                | Min.              | Max.              | Unit        |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------|
| DC Current Gain<br>at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$                                                                         | BC8456ADE~BC8458ADE<br>$h_{FE}$<br>BC8456BDE~BC8458BDE<br>$h_{FE}$<br>BC8456CDE~BC8458CDE<br>$h_{FE}$ | 110<br>200<br>420 | 220<br>450<br>800 | -<br>-<br>- |
| Collector Base Breakdown Voltage<br>at $I_C = 50\text{ }\mu\text{A}$                                                                      | BC8456DE<br>$V_{(BR)CBO}$<br>BC8457DE<br>BC8458DE                                                     | 80<br>50<br>30    | -<br>-<br>-       | V           |
| Collector Emitter Breakdown Voltage<br>at $I_C = 10\text{ mA}$                                                                            | BC8456DE<br>$V_{(BR)CEO}$<br>BC8457DE<br>BC8458DE                                                     | 65<br>45<br>30    | -<br>-<br>-       | V           |
| Emitter Base Breakdown Voltage<br>at $I_E = 50\text{ }\mu\text{A}$                                                                        | BC8456DE<br>$V_{(BR)EBO}$<br>BC8457DE<br>BC8458DE                                                     | 6<br>6<br>5       | -<br>-<br>-       | V           |
| Collector Base Cutoff Current<br>at $V_{CB} = 30\text{ V}$                                                                                | $I_{CBO}$                                                                                             | -                 | 15                | nA          |
| Emitter Base Cutoff Current<br>at $V_{EB} = 5\text{ V}$                                                                                   | $I_{EBO}$                                                                                             | -                 | 100               | nA          |
| Collector Emitter Saturation Voltage<br>at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$<br>at $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$ | $V_{CE(sat)}$                                                                                         | -<br>-            | 0.25<br>0.6       | V           |
| Base Emitter Voltage<br>at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$<br>at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$                 | $V_{BE}$                                                                                              | 0.58<br>-         | 0.7<br>0.77       | V           |
| Transition Frequency<br>at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$ , $f = 100\text{ MHz}$                                            | $f_T$                                                                                                 | 100               | -                 | MHz         |
| Collector Output Capacitance<br>at $V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$                                                | $C_{ob}$                                                                                              | -                 | 4.5               | pF          |

## BC8456DE~BC8458DE

### Electrical Characteristics at $T_a = 25^{\circ}\text{C}$ :TR2

| Parameter                                                                                                                                     | Symbol                                                            | Min.                             | Max.              | Unit              |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------|-------------------|-------------------|-------------|
| DC Current Gain<br>at $-V_{CE} = 5\text{ V}$ , $-I_C = 2\text{ mA}$                                                                           | BC8456ADE~BC8458ADE<br>BC8456BDE~BC8458BDE<br>BC8456CDE~BC8458CDE | $h_{FE}$<br>$h_{FE}$<br>$h_{FE}$ | 125<br>220<br>420 | 250<br>475<br>800 | -<br>-<br>- |
| Collector Base Breakdown Voltage<br>at $-I_C = 50\text{ }\mu\text{A}$                                                                         | BC8456DE<br>BC8457DE<br>BC8458DE                                  | $-V_{(BR)CBO}$                   | 80<br>50<br>30    | -<br>-<br>-       | V           |
| Collector Emitter Breakdown Voltage<br>at $-I_C = 10\text{ mA}$                                                                               | BC8456DE<br>BC8457DE<br>BC8458DE                                  | $-V_{(BR)CEO}$                   | 65<br>45<br>30    | -<br>-<br>-       | V           |
| Emitter Base Breakdown Voltage<br>at $-I_E = 50\text{ }\mu\text{A}$                                                                           |                                                                   | $-V_{(BR)EBO}$                   | 5                 | -                 | V           |
| Collector Base Cutoff Current<br>at $-V_{CB} = 30\text{ V}$                                                                                   |                                                                   | $-I_{CBO}$                       | -                 | 15                | nA          |
| Emitter Base Cutoff Current<br>at $-V_{EB} = 5\text{ V}$                                                                                      |                                                                   | $-I_{EBO}$                       | -                 | 100               | nA          |
| Collector Emitter Saturation Voltage<br>at $-I_C = 10\text{ mA}$ , $-I_B = 0.5\text{ mA}$<br>at $-I_C = 100\text{ mA}$ , $-I_B = 5\text{ mA}$ |                                                                   | $-V_{CE(sat)}$                   | -<br>-            | 0.3<br>0.65       | V           |
| Base Emitter Voltage<br>at $-V_{CE} = 5\text{ V}$ , $-I_C = 2\text{ mA}$<br>at $-V_{CE} = 5\text{ V}$ , $-I_C = 10\text{ mA}$                 |                                                                   | $-V_{BE}$                        | 0.6<br>-          | 0.75<br>0.82      | V           |
| Transition Frequency<br>at $-V_{CE} = 5\text{ V}$ , $-I_C = 10\text{ mA}$ , $f = 100\text{ MHz}$                                              |                                                                   | $f_T$                            | 100               | -                 | MHz         |
| Output Capacitance<br>at $-V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$                                                             |                                                                   | $C_{ob}$                         | -                 | 4.5               | pF          |

## BC8456DE~BC8458DE

### Electrical Characteristics Curves:TR1

Fig. 1 Output Characteristics Curve

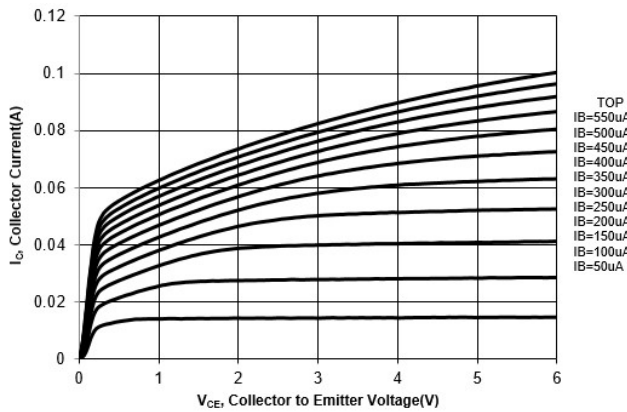


Fig. 2 Collector Current vs. Base to Emitter Voltage

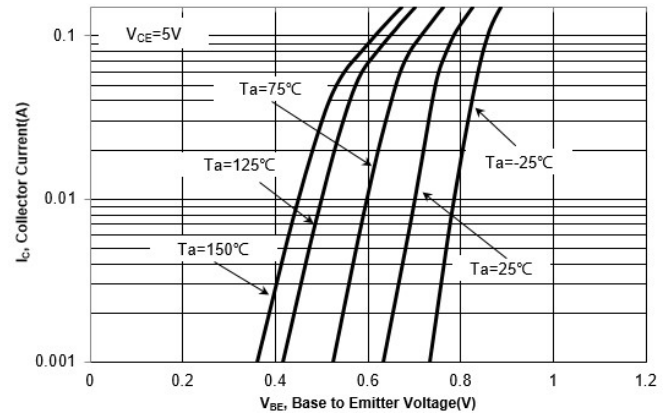


Fig. 3 DC Current Gain vs. Collector Current

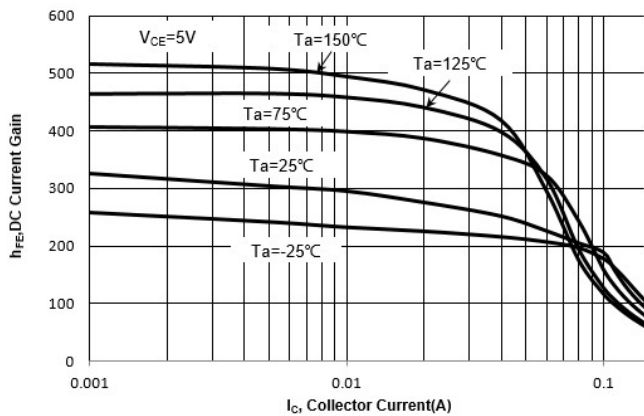


Fig. 4 V<sub>BESAT</sub> vs. Collector Current

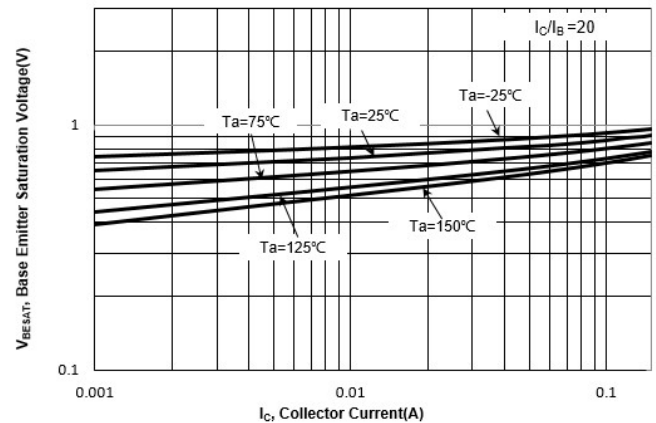


Fig. 5 V<sub>CESAT</sub> vs. Collector Current

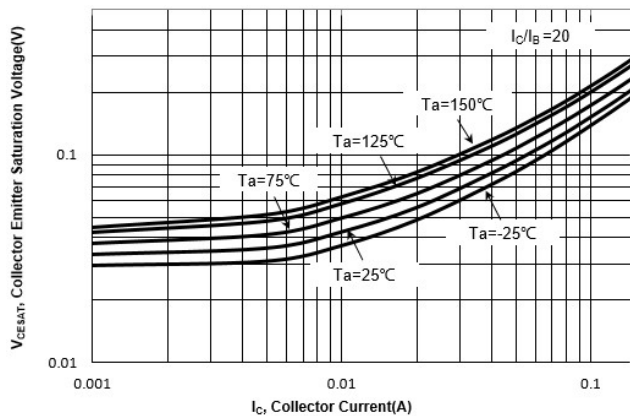
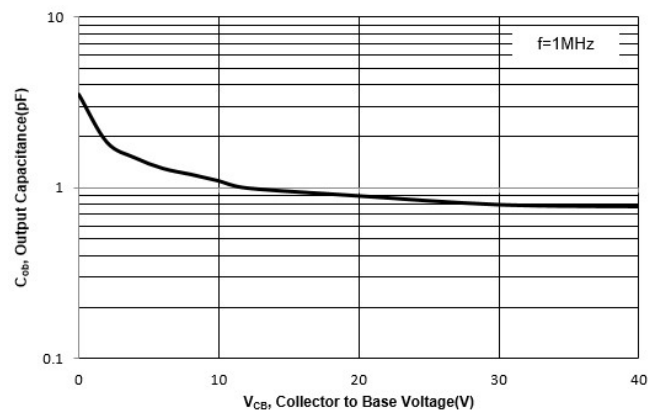


Fig. 6 Output Capacitance



## BC8456DE~BC8458DE

### Electrical Characteristics Curves:TR2

Fig. 1 Output Characteristics Curve

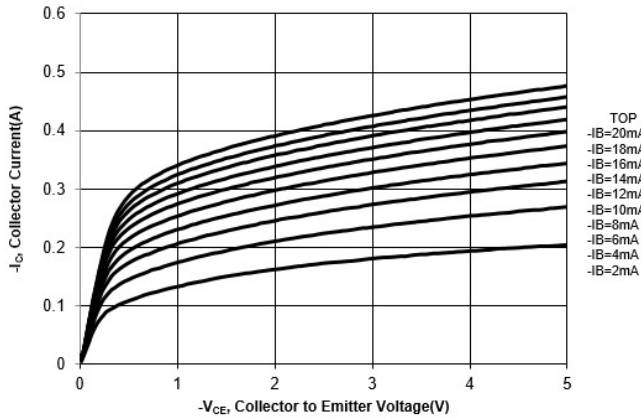


Fig. 2 Collector Current vs. Base to Emitter Voltage

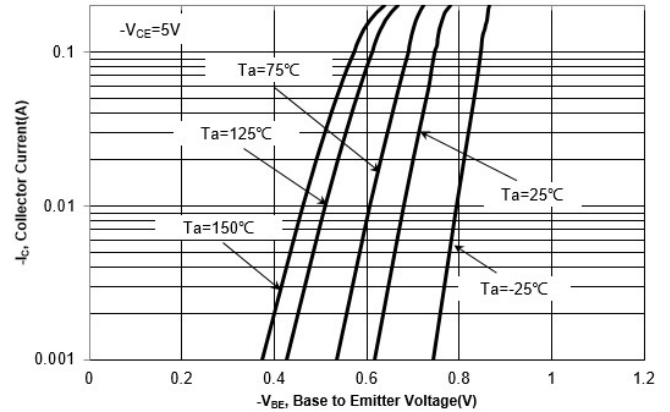


Fig. 3 DC Current Gain vs. Collector Current

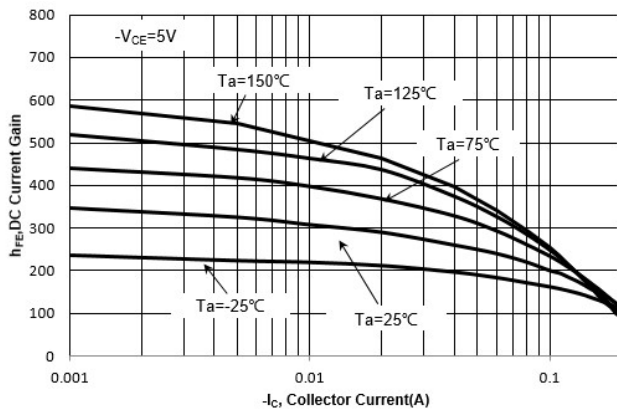


Fig. 4  $V_{\text{BESAT}}$  vs. Collector Current

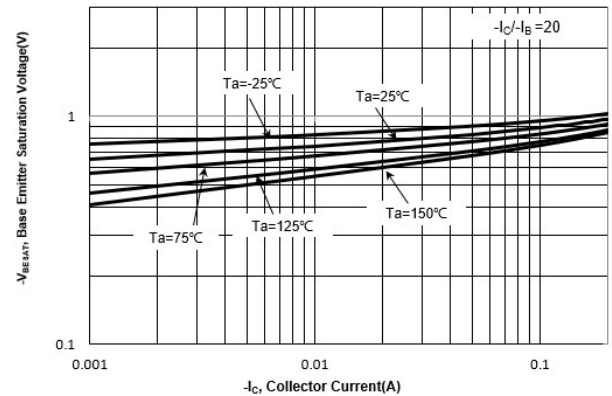


Fig. 5  $V_{\text{CESAT}}$  vs. Collector Current

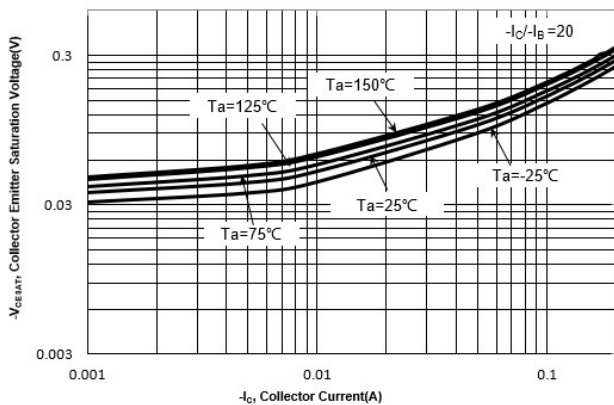
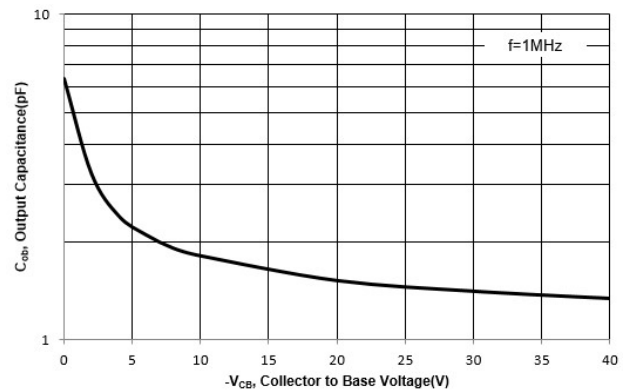


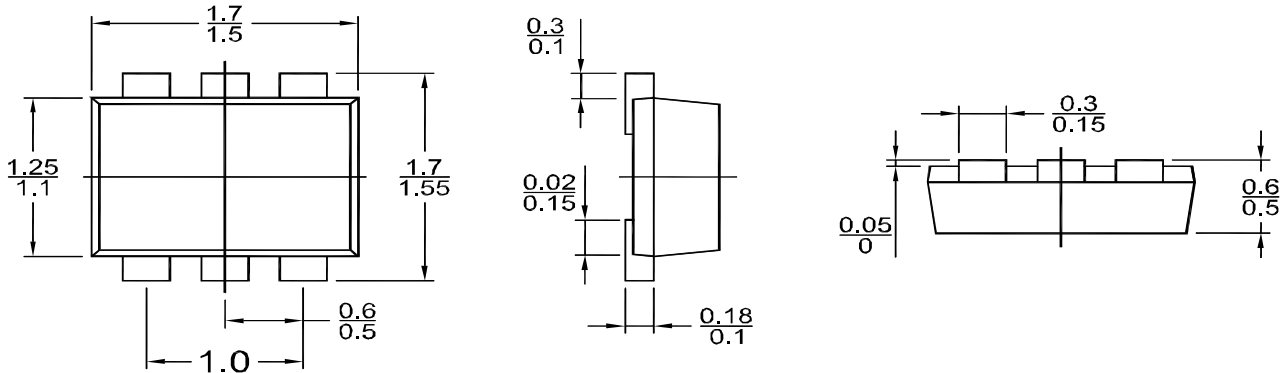
Fig. 6 Output Capacitance



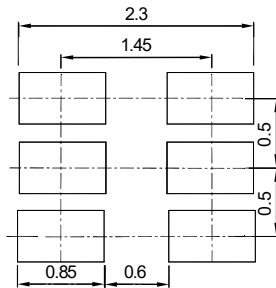
## BC8456DE~BC8458DE

### Package Outline Dimensions (Units: mm)

### SOT-563



### Recommended Soldering Footprint



### Packing information

| Package | Tape Width (mm) | Pitch   |               | Reel Size |      | Per Reel Packing Quantity |
|---------|-----------------|---------|---------------|-----------|------|---------------------------|
|         |                 | mm      | inch          | mm        | inch |                           |
| SOT-563 | 8               | 4 ± 0.1 | 0.157 ± 0.004 | 178       | 7    | 4,000                     |

### Marking information

" \*\* " = Part No.

| Type      | Marking | Type      | Marking | Type      | Marking |
|-----------|---------|-----------|---------|-----------|---------|
| BC8456ADE | 1J      | BC8457ADE | 1J      | BC8458ADE | 1J      |
| BC8456BDE | 1K      | BC8457BDE | 1K      | BC8458BDE | 1K      |
| BC8456CDE | 1L      | BC8457CDE | 1L      | BC8458CDE | 1L      |

" YM " = Date Code Marking

" Y " = Year

" M " = Month

Font type: Arial

